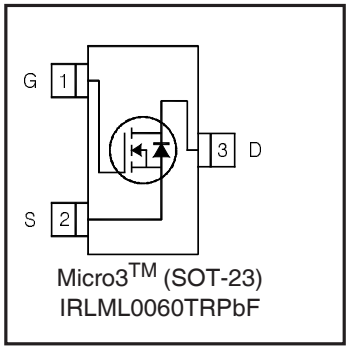
PD - 97439A

IRLML0060TRPbF

HEXFET® Power MOSFET

V_{DS}	60	V
$V_{GS\ Max}$	± 16	V
$R_{DS(on)\ max}$ (@V_{GS} = 10V)	92	mΩ
$R_{DS(on)\ max}$ (@V_{GS} = 4.5V)	116	mΩ



Micro3™ (SOT-23)
IRLML0060TRPbF

Application(s)

- Load/ System Switch

Features and Benefits

Features		Benefits
Industry-standard pinout		Multi-vendor compatibility
Compatible with existing Surface Mount Techniques	results in	Easier manufacturing
RoHS compliant containing no lead, no bromide and no halogen	⇒	Environmentally friendly
MSL1, Industrial qualification		Increased reliability

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	60	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	2.7	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	2.1	
I_{DM}	Pulsed Drain Current	11	
P_D @T_A = 25°C	Maximum Power Dissipation	1.25	W
P_D @T_A = 70°C	Maximum Power Dissipation	0.80	
	Linear Derating Factor	0.01	W/°C
V_{GS}	Gate-to-Source Voltage	± 16	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	—	100	°C/W
$R_{\theta JA}$	Junction-to-Ambient (t<10s) ④	—	99	

ORDERING INFORMATION:
See detailed ordering and shipping information on the last page of this data sheet.

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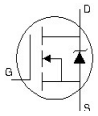
Electric Characteristics @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	——	——	V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.06	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	98	116	mΩ	V_{GS} = 4.5V, I_D = 2.2A ②
		——	78	92		V_{GS} = 10V, I_D = 2.7A ②
$V_{GS(th)}$	Gate Threshold Voltage	1.0	——	2.5	V	V_{DS} = V_{GS}, I_D = 25μA
I_{DSS}	Drain-to-Source Leakage Current	——	——	20	μA	V_{DS} = 60V, V_{GS} = 0V
		——	——	250		V_{DS} = 60V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	——	——	-100		V_{GS} = -20V
R_G	Internal Gate Resistance	——	1.6	——	Ω	
gfs	Forward Transconductance	7.6	——	——	S	V_{DS} = 25V, I_D = 2.7A
Q_g	Total Gate Charge	——	2.5	——	nC	I_D = 2.7A
Q_{gs}	Gate-to-Source Charge	——	0.7	——		V_{DS} =30V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	1.3	——		V_{GS} = 4.5V ②
$t_{d(on)}$	Turn-On Delay Time	——	5.4	——	ns	V_{DD} = 30V ②
t_r	Rise Time	——	6.3	——		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	——	6.8	——		R_G = 6.8Ω
t_f	Fall Time	——	4.2	——		V_{GS} = 4.5V
C_{iss}	Input Capacitance	——	290	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	37	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	21	——		f = 1.0MHz

Source - Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	1.6	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	11		
V_{SD}	Diode Forward Voltage	——	——	1.3	V	T_J = 25°C, I_S = 2.7A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	——	14	21	ns	T_J = 25°C, V_R = 30V, I_F=1.6A
Q_{rr}	Reverse Recovery Charge	——	13	20	nC	di/dt = 100A/μs ②

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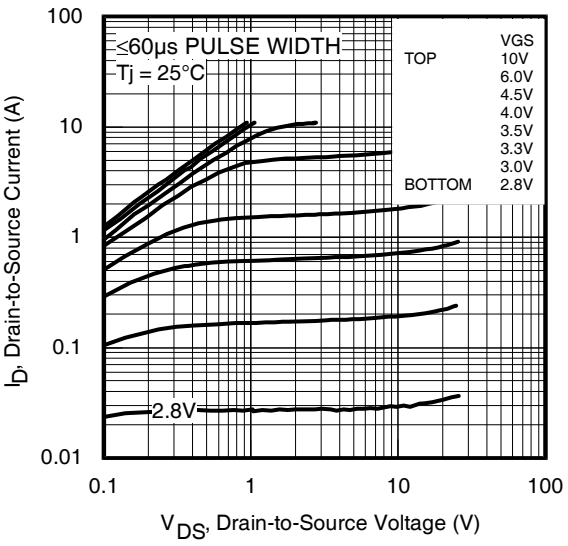

Fig 1. Typical Output Characteristics

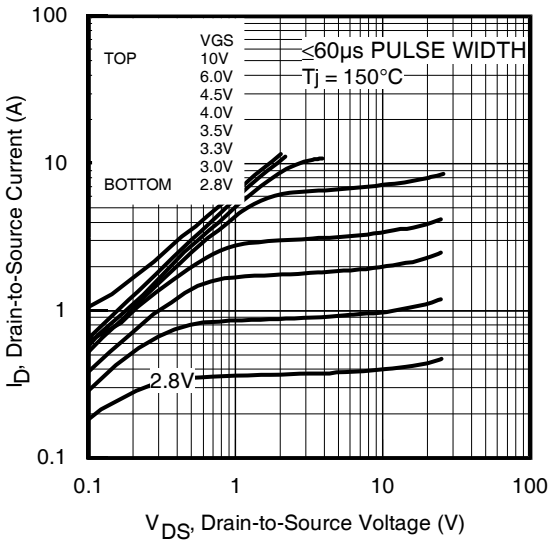

Fig 2. Typical Output Characteristics

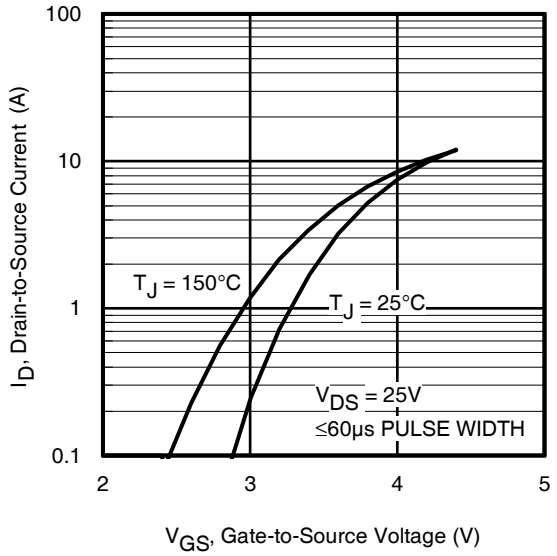

Fig 3. Typical Transfer Characteristics

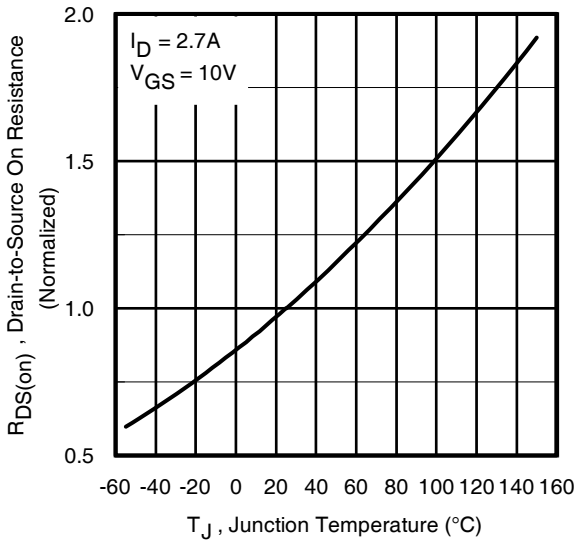

Fig 4. Normalized On-Resistance vs. Temperature

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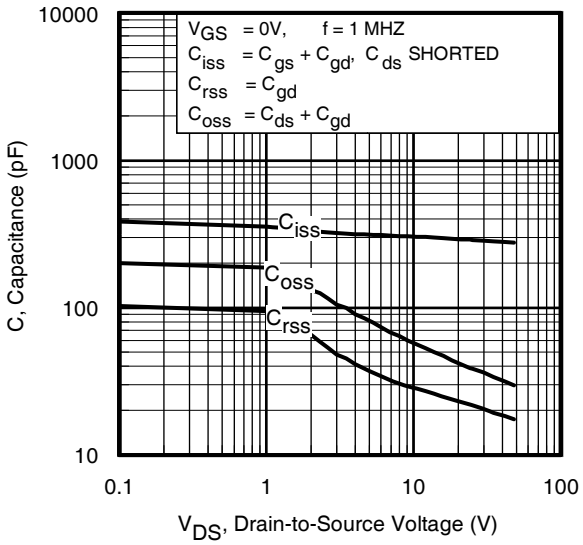

Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

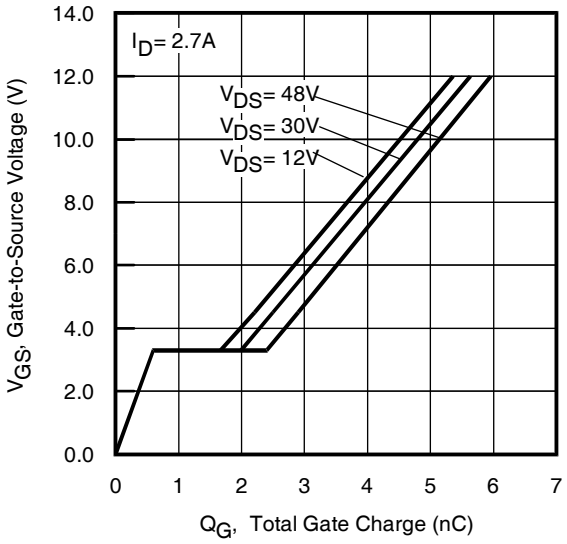

Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

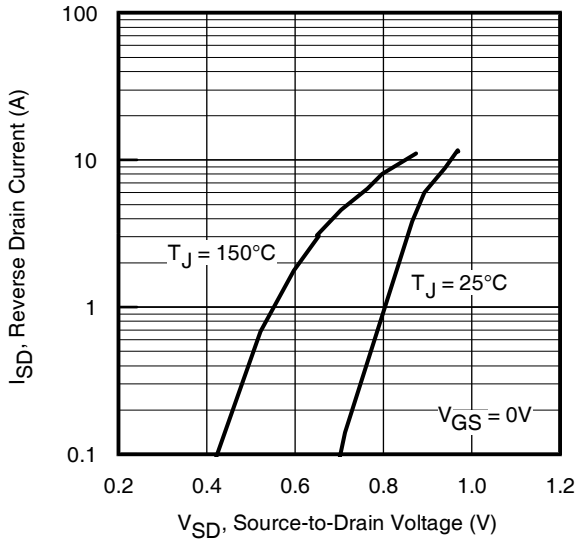

Fig 7. Typical Source-Drain Diode Forward Voltage

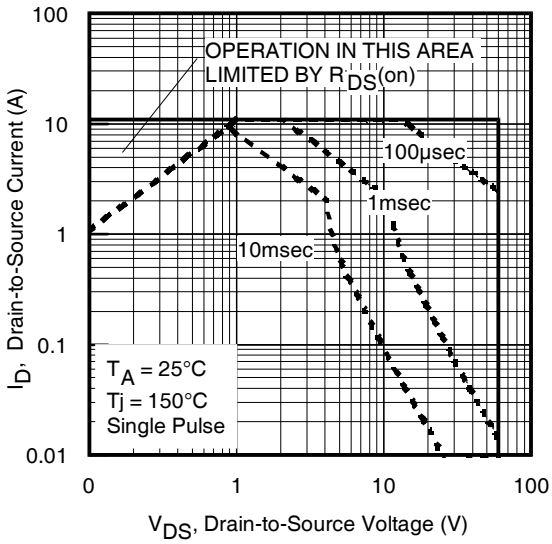

Fig 8. Maximum Safe Operating Area

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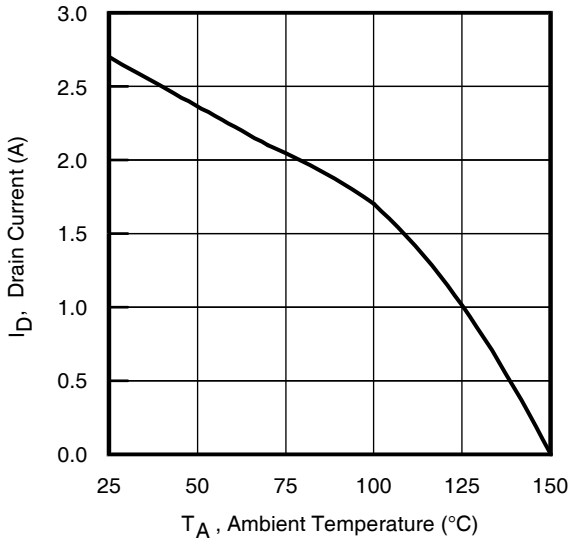

Fig 9. Maximum Drain Current vs. Ambient Temperature

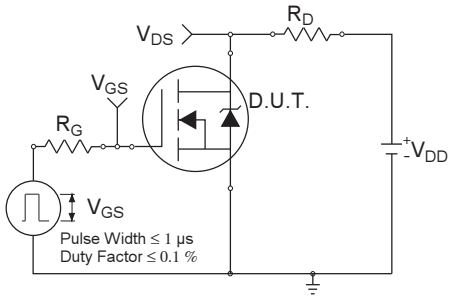

Fig 10a. Switching Time Test Circuit

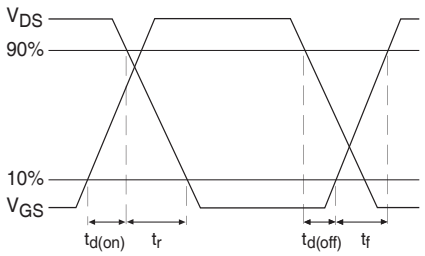

Fig 10b. Switching Time Waveforms

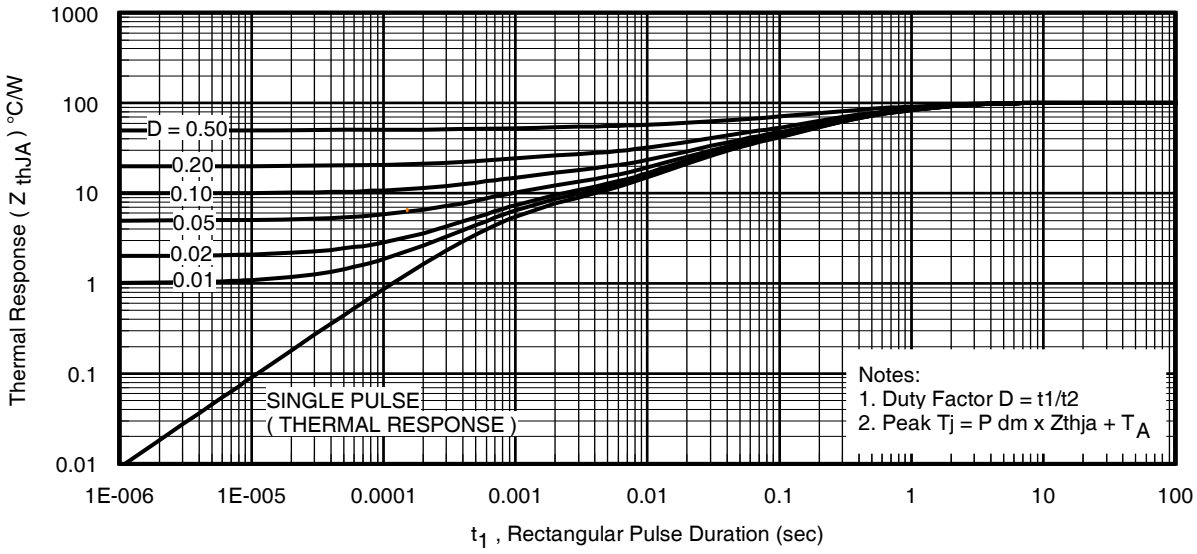

Fig 11. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

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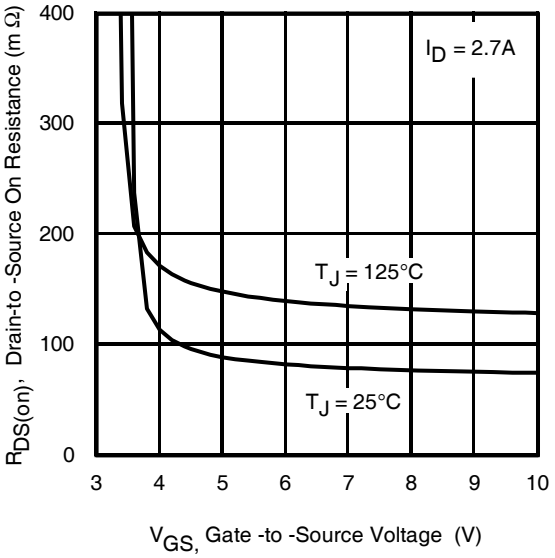

Fig 12. Typical On-Resistance vs. Gate Voltage

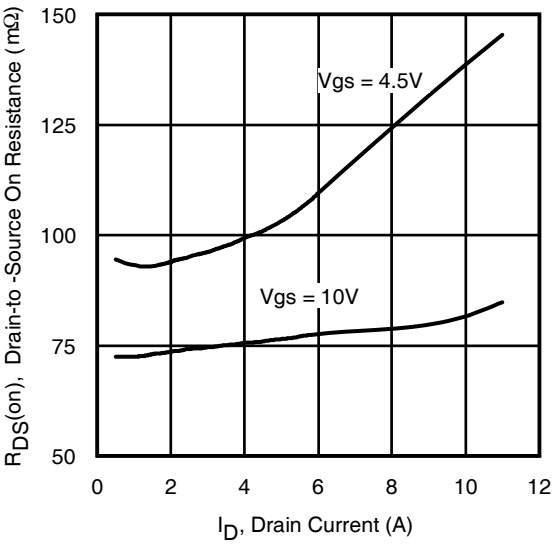

Fig 13. Typical On-Resistance vs. Drain Current

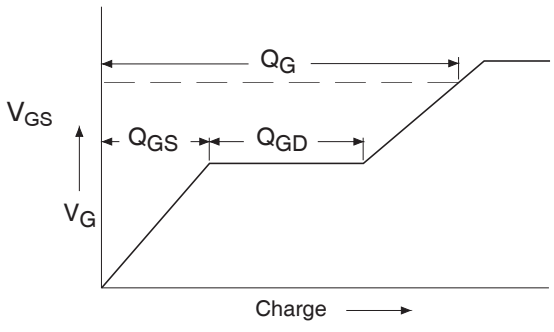

Fig 14a. Basic Gate Charge Waveform

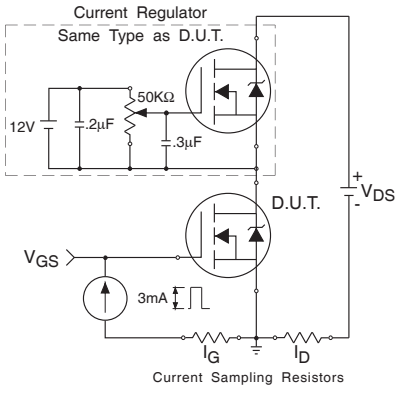

Fig 14b. Gate Charge Test Circuit

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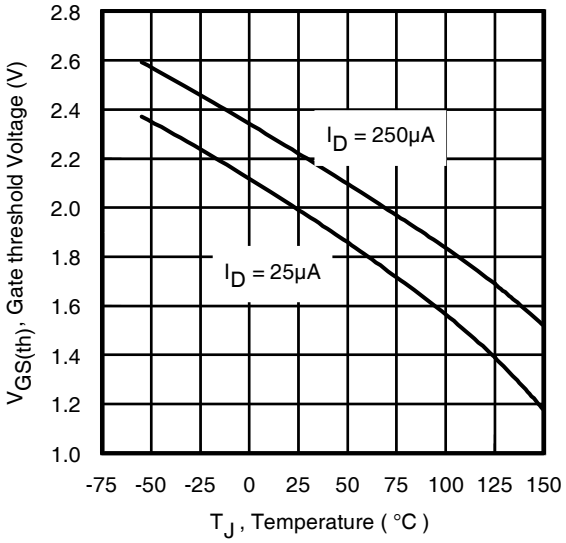


Fig 15. Typical Threshold Voltage vs. Junction Temperature

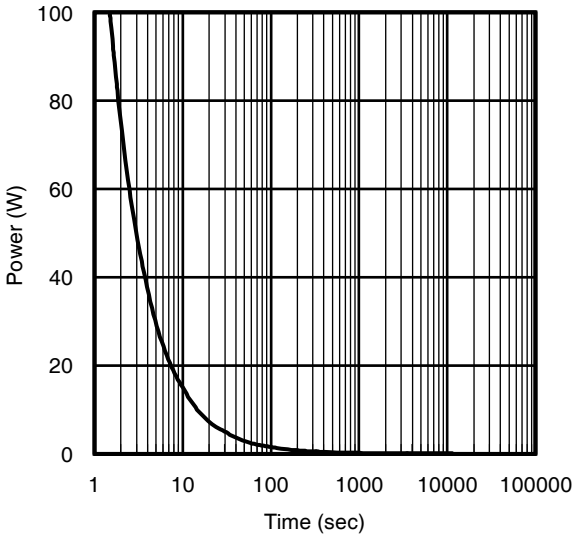
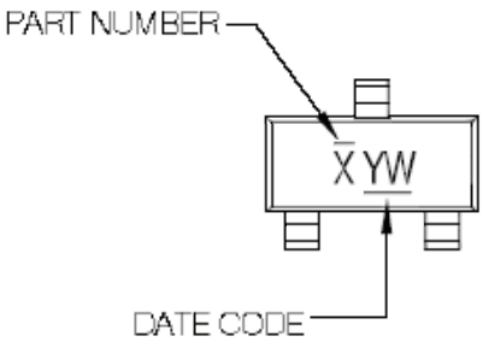


Fig 16. Typical Power vs. Time



IRLML0030 SOT-23	I20	KLS
IRLML0040 SOT-23	M20	KLS
IRLML0060 SOT-23	L20	KLS
IRLML0100 SOT-23	K20	KLS
IRLML2246 SOT-23-3	Y20	KLS
IRLML2502 SOT-23	G20	KLS
IRLML2803 SOT-23	B20	KLS
IRLML5103 SOT-23	D20	KLS
IRLML6244 SOT-23	S20	KLS
IRLML6246 SOT-23	T20	KLS
IRLML6302 SOT-23	C20	KLS
IRLML6346 SOT-23	V20	KLS
IRLML6401 SOT-23	F20	KLS
IRLML6402 SOT-23	E20	KLS
IRLML9301 SOT-23	P20	KLS

20 means:The 20th batch goods in year 2021.